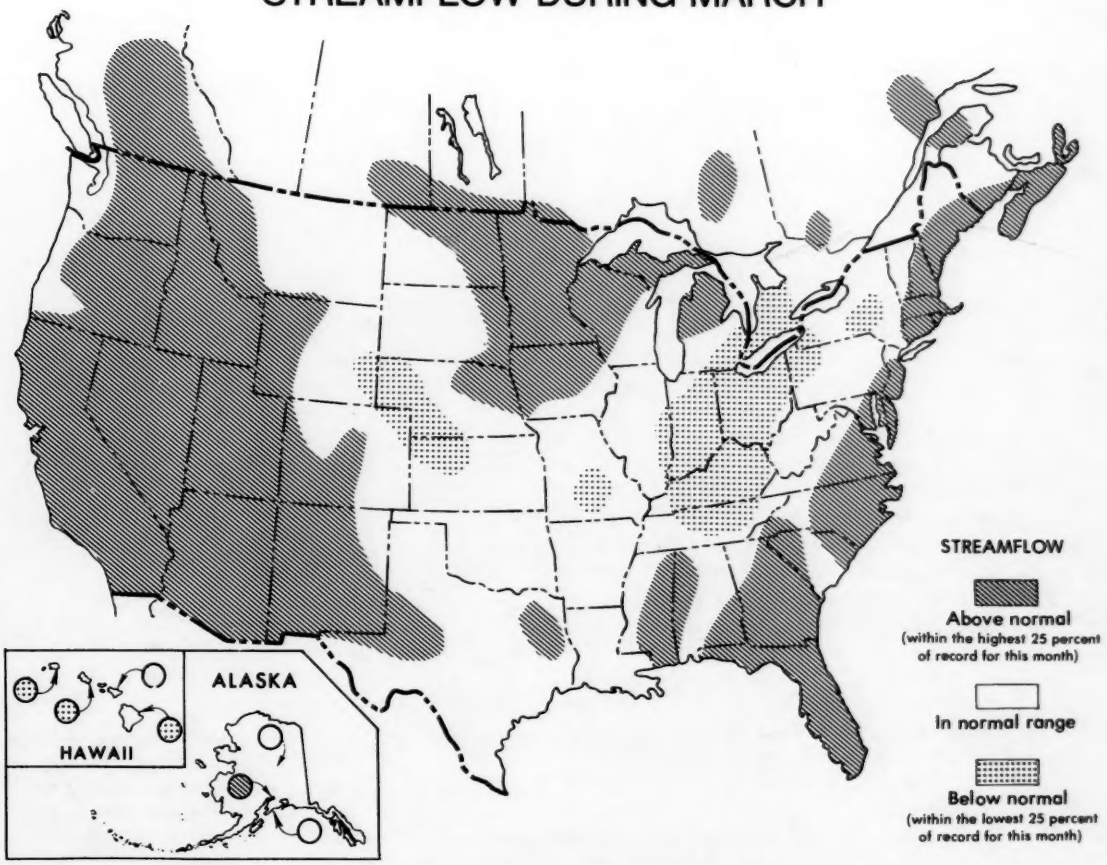
National Water Conditions

UNITED STATES
Department of the Interior
Geological Survey

CANADA
Department of the Environment
Water Resources Branch

MARCH 1983

STREAMFLOW DURING MARCH



Severe flooding, as a result of runoff from intense rains in southern California, caused flow rates on several streams that are not likely to be exceeded more than once (on the average) in 50 years. Property damage was in excess of $150 million. Flooding also occurred in Nevada, Mississippi, North Carolina and New Jersey.

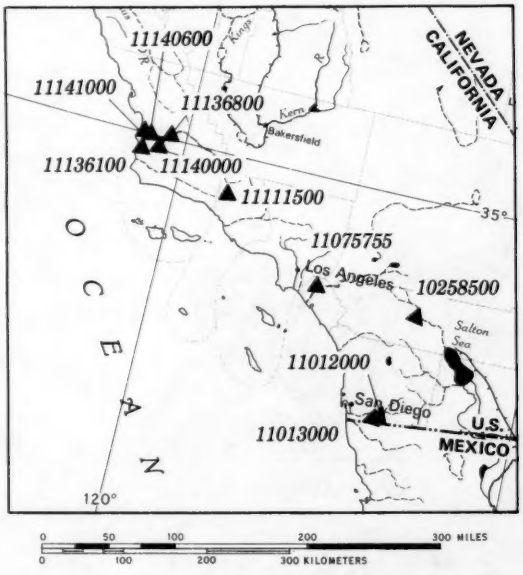
Drought conditions persisted in Hawaii and flows decreased to near record lows for the month in parts of the Ohio River basin. Elsewhere in the United States and southern Canada, monthly mean flows were generally in the normal range or above that range and were highest of record for March in parts of at least eight States.

STREAMFLOW CONDITIONS DURING MARCH 1983

Severe flooding occurred in southern California from Santa Barbara County to the Mexican border as a result of runoff from moderate to heavy rains during the period February 24 to March 5. Waves 10 to 12 feet high coupled with above-normal tides caused extensive damage to beach homes all along the coast. Mud slides closed parts of the Pacific Coast Highway in the Malibu area and were common occurrences in many areas. Damage estimates in the storm area exceeded 150 million dollars. The accompanying map, and table on page 3, show preliminary peak stage and discharge data for selected sites in the flooded area. Monthly mean discharge of Arroyo Seco near Pasadena (drainage area, 16.0 square miles) increased sharply, was more than 22 times the median discharge, and remained in the above-normal range for the 5th consecutive month. The monthly mean flow of 220 cubic feet per second was second highest for March in 73 years of record.

Elsewhere in the Nation, farm lands adjacent to the Humboldt River in Nevada experienced flooding during the second week of the month from snowmelt runoff triggered by rains at low altitudes in the upper reaches of the river near Elko. In Mississippi, runoff from heavy rains during the first week of March, especially in the Pearl River basin, caused considerable alarm in Jackson but a major flood did not materialize and damage was minimal. Indicative of the above-normal runoff in Mississippi was that of the Big Black River near Bovina where the cumulative runoff for the first 6 months of the 1983 water year exceeded the median runoff for the entire year by 100 percent. In North Carolina, runoff from moderate rainfall on the 5th and heavy rainfall on the 18th caused minor to extensive flooding on small streams in the eastern Piedmont and Coastal Plain. In northeastern New Jersey, moderate flooding occurred in the Passaic River basin and runoff was in the above-normal range in the southern part of the State for the first time since July 1982.

Monthly mean flows were in the normal range or above that range in most of the United States and southern Canada during March. However, in the Ohio River Valley and in southern parts of New York, Ontario, Michigan, and Missouri, in western parts of Kansas and Nebraska, and in most of Hawaii, flows were in the below-normal range. In southern Ohio, for example, monthly mean flow of Scioto River at Higby decreased sharply to 1,507 cfs, only 16 percent of median, and remained in the below-normal range for the second consecutive month. (See graph on page 6.) Similarly, in northern Kentucky, the mean flow of 1,444 cfs in Licking River at Catawba (drainage area 3,300 square miles), was lowest for March in 57 years of record. By contrast, monthly mean discharge of Peace River at Arcadia, Florida, increased seasonally to the second highest March flow for period of record and remained in the above-normal range for the second consecutive month. (See graph on page 6.) Similarly, monthly and/or daily mean



Location of stream-gaging stations in California, described in table of peak stages and discharges.

CONTENTS

Provisional data; subject to revision

STAGES AND DISCHARGES FOR THE FLOODS OF MARCH 1983 AT SELECTED SITES IN CALIFORNIA

WRD station number	Stream and place of determination	Drainage area (square miles)	Period of record (years)	Maximum flood previously known			Maximum during present flood				
				Date	Stage (feet)	Discharge (cfs)	Date	Stage (feet)	Discharge		Recurrence interval (years)
									Cfs	Cfs per square mile	
	SALTON SEA BASIN										
10258500	Palm Canyon Creek near Palm Springs	93.3	47	Feb. 21, 1980	7.29	7,000	Mar. 1	6.37	4,100	44	40
	TIJUANA RIVER BASIN										
11012000	Cottonwood Creek above Tecate Creek, near Dulzura	310	47	Feb. 21, 1980	11.15	11,700	3	(a)	6,500	21	50
11013000	Tijuana River near Dulzura	481	47	Feb. 21, 1980	10.66	12,200	3	(a)	7,000	15	45
	SANTA ANA RIVER BASIN										
11075755	Santa Ana River at Ball Road, at Anaheim	1,587	7	Feb. 16, 1980	5.08	11,070	1	6.2	18,500	12	(b)
11111500	Sespe Creek near Wheeler Springs	49.5	36	Feb. 10, 1978	14.18	10,700	1	15.04	12,500	253	25
	SAN ANTONIO CREEK BASIN										
11136100	San Antonio Creek near Casmalia	135	28	Mar. 4, 1978	13.22	3,440	1	14.32	4,100	30	50
	SANTA MARIA RIVER BASIN										
11136800	Cuyama River below Buckhorn Canyon, near Santa Maria	886	26	Feb. 25, 1969	13.70	17,800	1	12.66	30,000	34	50
11140000	Sisquoc River near Garey	471	43	Jan. 25, 1969	13.00	24,500	1	11.53	26,500	56	25
11140600	Bradley Ditch near Donovan Road, at Santa Maria	(a)	12	Mar. 4, 1978	5.85	379	1	4.61	545	(a)	(a)
11141000	Santa Maria River at Guadalupe	1,741	43	Jan. 16, 1952	8.18	32,800	2	9.44	35,000	20	25

[a]Data not available.
[b]Regulated stream.

flows were highest of record for the month in parts of at least eight other states. (See table at bottom of page 6.)

In Hawaii, streamflow at all index stations remained in the below-normal range and were lowest of record at index stations on the islands of Maui and Hawaii. Water restrictions continued for the district of Puna, Hawaii, and on March 14, Governor Ariyoshi declared the island of Hawaii a drought disaster area. At Waiakea Stream near Mountain View, island of Hawaii (drainage area, 17.4 square miles), no flow was observed during the entire month, and the second consecutive month of record-low flows were recorded at that site.

The water-surface elevation of Great Salt Lake in Utah rose 0.75 foot during March, bringing it to 4,203.2 feet above mean sea level at the end of the month, and was at its highest level since 1927. The level of Great Salt Lake was 3.30 feet higher than one year ago.

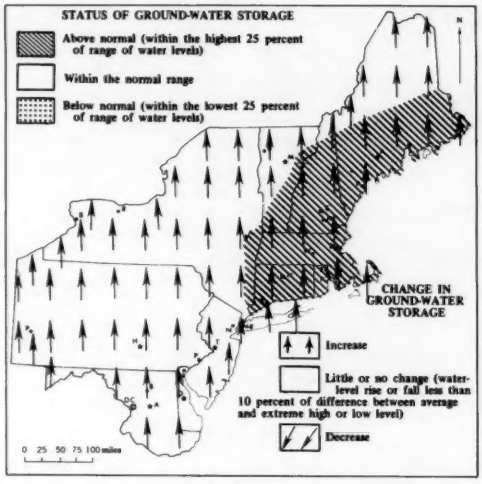
Combined flow of three large rivers—Mississippi, St. Lawrence, and Columbia—averaged 1,276,500 cfs during March, up 11 percent from last month and 8 percent above average for March. Because these three large rivers account for streamflow runoff for more than half of the conterminous United States, their combined flow provides a useful check on the status of the nation's water resources.

Monthend contents of principal reservoirs were near or above average at most locations during March.

GROUND-WATER CONDITIONS DURING MARCH 1983

Ground-water levels rose throughout the Northeast in response to recharge from late winter and early spring precipitation, including rains that were much above normal in the coastal States of the region. (See map.) Ground-water levels near end of month remained above average in southern New England, and were above average also in southern Maine, New Hampshire, and Vermont. Levels in some key observation wells in Connecticut, Rhode Island, Massachusetts, and southeastern New Hampshire were the highest ever recorded in March during more than 30 years of measurements. In two of the key wells in southern Connecticut, levels were at alltime highs (for any month) for 27 and 39 years of record, respectively. Outside of New England, levels were mostly within the average range of levels occurring at the end of March.

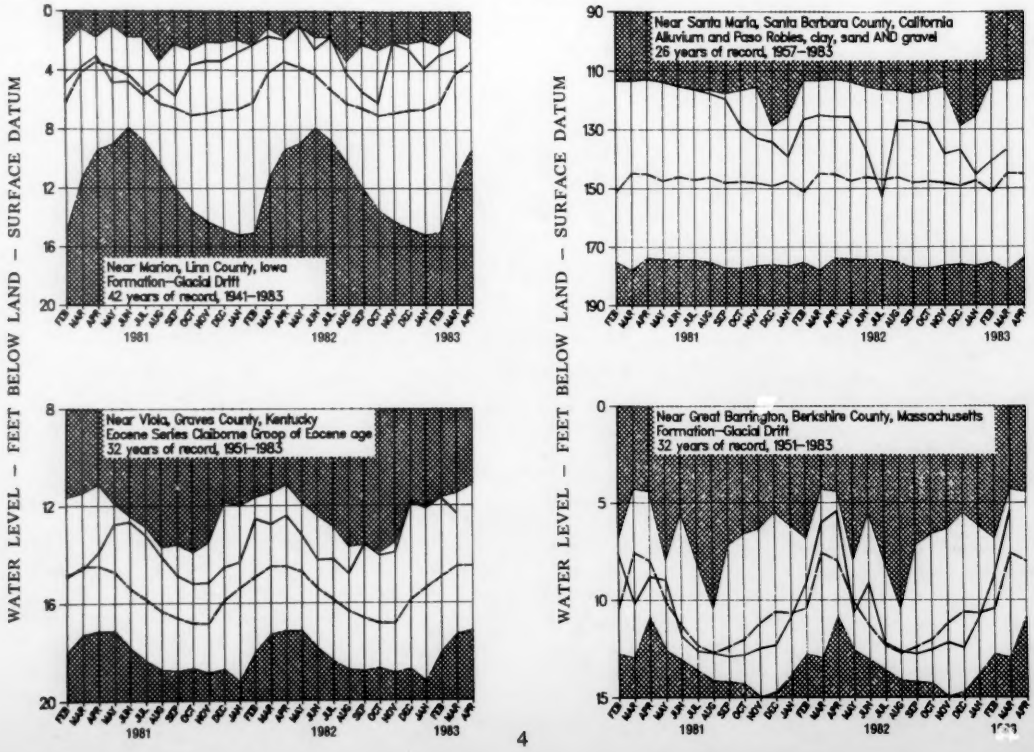
In the southeastern States, levels rose in Virginia, North Carolina, Arkansas, Mississippi, and Florida. Levels mostly declined in Kentucky, in response to below-average precipitation. Trends were mixed elsewhere in the region. Levels were above average in North



Map shows ground-water storage near end of March and change in ground-water storage from end of Feburary to end of March.

MONTH-END GROUND-WATER LEVELS IN KEY WELLS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates average of monthly levels in previous years. Heavy line indicates level for current period.



WATER LEVELS IN KEY OBSERVATION WELLS IN SOME REPRESENTATIVE AQUIFERS IN THE CONTERMINOUS UNITED STATES—MARCH 1983

Aquifer and location	Current water level in feet below land-surface datum	Departure from average in feet	Net change in water level in feet since:		Year records began	Remarks
			Last month	Last year		
Glacial drift at Hanska, south-central Minnesota	-2.85	+4.44	+2.83	+0.83	1943	March high.
Glacial drift at Roscommon in north-central part of Lower Peninsula, Michigan	-3.56	+1.01	+0.71	+1.79	1935	
Glacial drift at Marion, Iowa	-2.59	+1.51	+0.30	-0.88	1941	
Glacial drift at Princeton in northwestern Illinois	-6.63	+3.01	+1.15	-0.02	1943	
Petersburg Granite, southeastern Piedmont near Fall Zone, Colonial Heights, Virginia	-12.11	+2.28	+1.01	+1.22	1939	
Glacial outwash sand and gravel, Louisville, Kentucky	-19.03	+6.93	-0.19	-0.67	1946	
500-foot sand aquifer near Memphis, Tennessee (U.S. well no. 2)	-101.90	-14.21	+0.13	+1.65	1941	
Granite in eastern Piedmont Province, Chapel Hill, North Carolina	-40.60	+1.62	+0.67	+3.14	1931	
Sparta Sand in Pine Bluff industrial area, Arkansas	-230.70	-26.83	+1.75	+9.50	1958	
Copper Ridge and Chepultepec Dolomites, Centreville, Alabama	-25.2	+1.3	+0.5	+2..	1952	
Limestone aquifer on Cockspur Island, Savannah area, Georgia	-20.65	-3.91	+0.20	+2.70	1956	
Sand and gravel in Puget Trough, Tacoma, Washington	-101.12	+7.03	+0.23	+1.36	1952	
Pleistocene glacial outwash gravel, North Pole, northern Idaho (U.S. well no. 3)	-458.2	+3.6	+0.8	+5.8	1929	
Snake River Group: southwestern Snake River Plain aquifer, at Eden, Idaho	-128.4	-7.8	-0.9	+1.0	1957	
Terrace gravel at Missoula, Montana	-19.88	-0.25	-2.48	-0.48	1960	
Alluvial sand and gravel, Platte River Valley, Nebraska (U.S. well no. 6)	-2.39	+2.31	-0.35	+1.59	1935	
Alluvial valley fill in Steptoe Valley, Nevada	-9.47	+3.45	+0.58	+1.14	1950	March high.
Ogallala Formation, Kansas Agricultural Experiment Station at Colby in the High Plains of northwestern Kansas	-124.36	-7.59	-0.02	-0.48	1947	March low.
Alluvium and Paso Robles, clay, sand, and gravel, Santa Maria Valley, California	-136.45	+6.28	+4.20	-11.45	1957	
Valley fill, Elfrida area, Douglas, Arizona (U.S. well no. 15)	-110.3	-34.05	+4.3	+2.5	1951	
Berrendo-Smith well in San Andres Limestone, Roswell artesian basin of Pecos Valley, New Mexico (U.S. well no. 1-A)	-56.75	-2.20	-2.37	-0.67	1966	
Hueco bolson, El Paso area, Texas	-259.34	-15.78	+0.61	-0.01	1965	March low.
Evangeline aquifer, Houston area, Texas	-316.43	-23.61	+4.25	+2.16	1965	

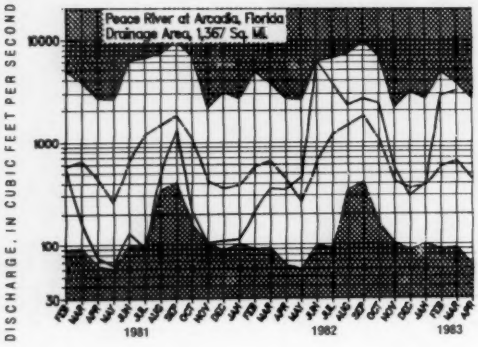
Carolina, Alabama, and in most of Kentucky, and were below average in Arkansas and Louisiana. Levels were mixed with respect to average in other reporting States.

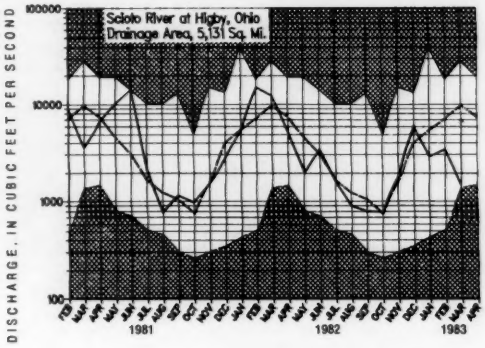
In the central and western Great Lakes States, levels rose and were near or above average in Minnesota, Wisconsin, and Michigan, and generally declined in Indiana except locally in response to precipitation. Trends were mixed and below average in Ohio, and mixed and above average in Iowa. A new high level for March was recorded in Minnesota, and two new lows for March occurred in Ohio.

In the western States, levels rose in Washington, North Dakota, and southern California; trends were mixed in other States. Levels were above average in Washington, North Dakota, and Nebraska, and were below average in Montana, Arizona, New Mexico, and Texas. A new high ground-water level for March was again recorded in Nevada in the key well in Steptoe Valley. New low levels for March were observed in wells in Nevada, Kansas, New Mexico, and Texas. A new all-time low in 20 years of record occurred in the Avra Valley key well in Arizona.

SURFACE WATER – MONTHLY MEAN DISCHARGE IN KEY STREAMS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period, 1951–80. Heavy line indicates mean for current period.



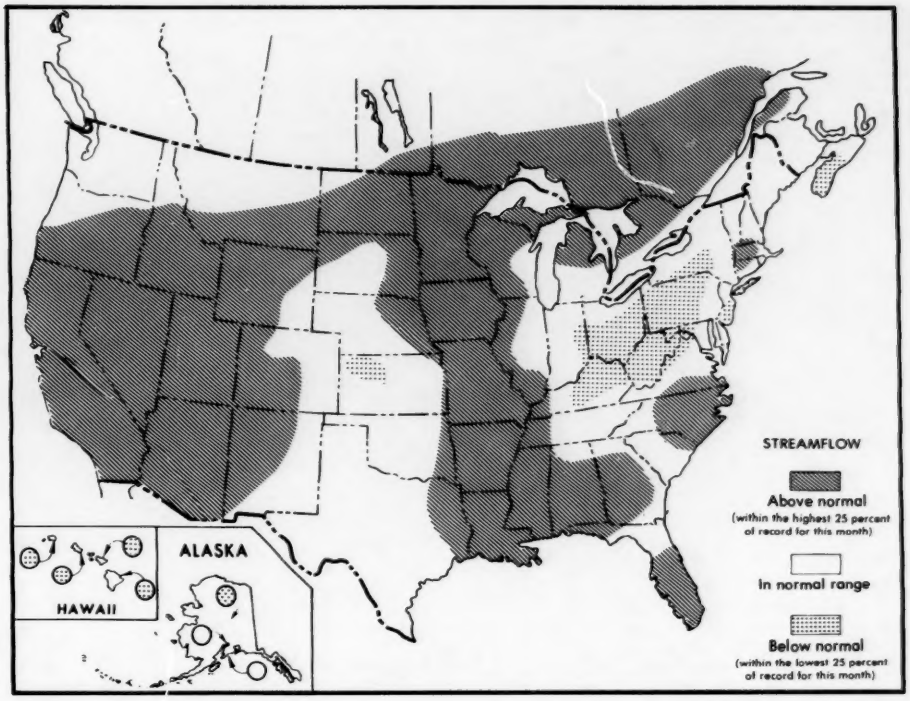


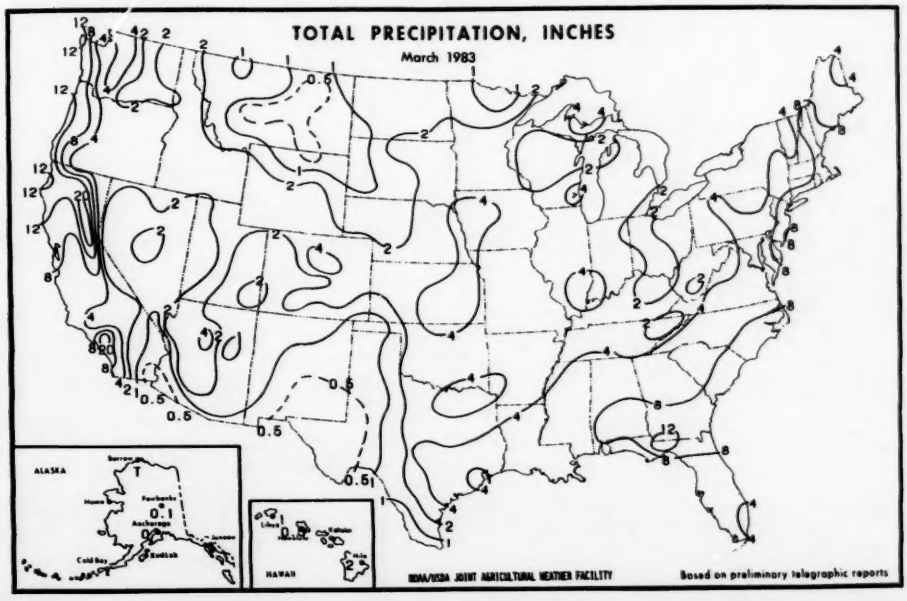
NEW MAXIMUMS DURING MARCH 1983 AT STREAMFLOW INDEX STATIONS

Station number	Stream and place of determination	Drainage area (square miles)	Years of record	Previous March Maximums (period of record)		March 1983			
				Monthly mean in cfs (year)	Daily mean in cfs (year)	Monthly mean in cfs	Percent of median	Daily mean in cfs	Day
01188000	Burlington Brook near Burlington, Connecticut.	4.13	52	34.2 (1936)	270 (1979)	44.90	279	418	19
02132000	Lynches River at Effingham, South Carolina.	1,030	54	4,173 (1971)	11,300 (1971)	4,887	217	10,300	24
05280000	Crow River at Rockford, Minnesota.	2,520	58	2,808 (1966)	9,350 (1916)	4,122	950	5,500	13
05330000	Minnesota River near Jordan, Minnesota.	16,200	49	12,920 (1973)	25,000 (1969)	20,958	660	29,400	9
05331000	Mississippi River at St. Paul, Minnesota.	36,800	85	31,410 (1966)	53,100 (1920)	43,223	559	63,200	12
05480500	Des Moines River at Fort Dodge, Iowa.	4,190	51	8,099 (1973)	20,000 (1961)	11,045	860	18,190	8
06485500	Big Sioux River at Akron, Iowa.	9,030	55	5,652 (1973)	50,700 (1962)	8,550	588	20,200	9
09448500	Gila River at Head of Safford Valley near Solomon, Arizona.	7,896	69	3,295 (1978)	17,400 (1978)	3,350	1,063	7,600	25
09471000	San Pedro River at Charleston, Arizona.	1,219	72	160 (1915)	350 (1915)	111	787	699	5
10322500	Humboldt River at Palisade, Nevada.	5,010	76	1,917 (1921)	4,210 (1921)	2,870	598	6,320	6
11425500	Sacramento River at Verona, California.	21,257	57	57,700 (1938)	76,300 (1940)	74,664	238	84,800	4
11427000	North Fork American River at North Fork Dam, California.	342	42	3,042 (1943)	12,600 (1943)	4,489	322	19,400	13
14046500	John Day River at Service Creek, Oregon.	5,090	55	9,383 (1972)	26,800 (1932)	10,020	331	19,060	14

SUPPLEMENTAL DATA FOR SIX-MONTH PERIOD ENDING MARCH 31, 1983

STREAMFLOW, OCTOBER 1, 1982—MARCH 31, 1983





(From Weekly Weather and Crop Bulletin published by the National Weather Service and Department of Agriculture.)

Provisional data; subject to revision

USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END OF MARCH 1983

[Contents are expressed in percent of reservoir capacity. The usable storage capacity of each reservoir is shown in the column headed "Normal maximum."]

Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	Percent of normal maximum				Normal maximum (acre-feet)[a]
	End of Mar. 1983	End of Mar. 1982	Average for end of Mar.	End of Feb. 1983	
NORTHEAST REGION					
NOVA SCOTIA					
Rossignol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook Reservoirs (P)	53	77	64	42	[b]226,300
QUEBEC					
Allard (P)	57	29	32	65	280,600
Gouin (P)	59	39	47	58	6,954,000
MAINE					
Seven reservoir systems (MP)	58	36	35	50	4,098,000
NEW HAMPSHIRE					
First Connecticut Lake (P)	46	15	16	46	76,450
Lake Francis (FPR)	46	16	21	49	99,310
Lake Winnipesaukee (PR)	101	62	64	78	165,700
VERMONT					
Harriman (P)	55	25	34	44	116,200
Somerset (P)	63	45	52	62	57,390
MASSACHUSETTS					
Cobble Mountain and Borden Brook (MP)	89	81	78	74	77,920
NEW YORK					
Great Sacandaga Lake (FPR)	71	29	48	51	786,700
Indian Lake (FMP)	56	42	48	58	103,300
New York City reservoir system (MW)	87	85	...	67	1,680,000
NEW JERSEY					
Wanaque (M)	102	94	89	92	85,100
PENNSYLVANIA					
Allegheny (FPR)	35	34	35	31	1,180,000
Pymatuning (FMR)	94	106	94	85	188,000
Raystown Lake (FR)	57	68	55	68	761,900
Lake Wallenpaupack (PR)	66	86	64	71	157,800
MARYLAND					
Baltimore municipal system (M)	77	76	92	64	255,800
SOUTHEAST REGION					
NORTH CAROLINA					
Bridgewater (Lake James) (P)	100	84	90	90	288,800
Narrows (Badin Lake) (P)	100	94	100	100	128,900
High Rock Lake (P)	100	67	82	92	234,800
SOUTH CAROLINA					
Lake Murray (P)	91	87	78	87	1,614,000
Lakes Marion and Moultrie (P)	93	85	80	92	1,862,000
SOUTH CAROLINA--GEORGIA					
Clark Hill (FP)	84	82	74	85	1,730,000
GEORGIA					
Burton (PR)	82	84	84	75	104,000
Sinclair (MPR)	95	82	89	93	214,000
Lake Sidney Lanier (FMPR)	67	56	60	65	1,686,000
ALABAMA					
Lake Martin (P)	95	85	89	78	1,373,000
TENNESSEE VALLEY					
Clinch Projects: Norris and Melton Hill Lakes (FPR)	44	54	52	39	2,229,300
Douglas Lake (FPR)	51	37	43	24	1,394,000
Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parksville Lakes (FPR)	63	63	64	51	1,012,000
Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR)	56	62	56	45	2,880,000
Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR)	61	62	63	51	1,478,000
WESTERN GREAT LAKES REGION					
WISCONSIN					
Chippewa and Flambeau (PR)	67	26	26	39	365,000
Wisconsin River (21 reservoirs) (PR)	66	8	24	41	399,000
MINNESOTA					
Mississippi River headwater system (FMR)	21	15	18	18	1,640,000
MIDCONTINENT REGION					
NORTH DAKOTA					
Lake Sakakawea (Garrison) (FIPR)	85	71	82	86	22,700,000
SOUTH DAKOTA					
Angostura (I)	95	62	81	94	127,600
Belle Fourche (I)	96	51	62	95	185,200
Lake Francis Case (FIP)	77	79	81	73	4,834,000
Lake Oahe (FIP)	90	77	...	84	22,530,000
***MIDCONTINENT REGION*—Continued**					
SOUTH DAKOTA—Continued					
Lake Sharpe (FIP)	100	99	100	102	1,725,000
Lewis and Clarke Lake (FIP)	84	78	84	78	477,000
NEBRASKA					
Lake McConaughy (IP)	84	82	76	82	1,948,000
OKLAHOMA					
Eufaula (FPR)	95	107	86	105	2,378,000
Keystone (FPR)	84	96	102	90	661,000
Tenkiller Ferry (FPR)	101	104	92	104	628,200
Lake Altus (FIMR)	65	18	53	59	133,000
Lake O'The Cherokees (FPR)	88	100	87	92	1,492,000
OKLAHOMA--TEXAS					
Lake Texoma (FMPRW)	94	97	88	94	2,722,000
TEXAS					
Bridgeport (IMW)	88	100	45	86	386,400
Canyon (FMR)	94	93	77	94	385,600
International Amistad (FIMPW)	86	102	84	88	3,497,000
International Falcon (FIMPW)	74	94	75	71	2,668,000
Livingston (IMW)	103	103	86	103	1,788,000
Possum Kingdom (IMPRW)	87	88	95	88	570,200
Red Bluff (PI)	18	20	30	17	307,000
Toledo Bend (P)	96	93	86	99	4,472,000
Twin Buttes (FIM)	37	51	32	37	177,800
Lake Kemp (IMW)	87	60	85	87	268,000
Lake Meredith (FWM)	53	34	36	52	796,900
Lake Travis (FIMPRW)	87	96	81	82	1,144,000
THE WEST					
WASHINGTON					
Ross (PR)	34	30	29	46	1,052,000
Franklin D. Roosevelt Lake (IP)	38	31	49	98	5,022,000
Lake Chelan (PR)	40	30	31	35	676,100
Lake Cushman (PR)	86	87	84	30	359,500
Lake Merwin (P)	99	100	97	99	245,600
IDAHO					
Boise River (4 reservoirs) (FIP)	66	53	66	61	1,235,000
Coeur d'Alene Lake (P)	72	76	71	98	238,500
Pend Oreille Lake (FP)	60	61	51	77	1,561,000
IDAHO--WYOMING					
Upper Snake River (8 reservoirs) (MP)	73	68	74	77	4,401,000
WYOMING					
Boysen (FIP)	64	61	63	68	802,000
Buffalo Bill (IP)	72	49	60	78	421,300
Keyhole (F)	35	23	48	34	193,800
Pathfinder, Seminoe, Alcova, Kortes, Glendo, and Guernsey Reservoirs (I)	62	46	49	59	3,056,000
COLORADO					
John Martin (FIR)	22	14	18	17	364,400
Taylor Park (IR)	52	34	55	64	106,200
Colorado–Big Thompson project (I)	57	44	55	44	722,600
COLORADO RIVER STORAGE PROJECT					
Lake Powell; Flaming Gorge, Fontenelle, Navajo, and Blue Mesa Reservoirs (IFPR)	88	76	...	87	31,620,000
UTAH--IDAHO					
Bear Lake (IPR)	78	67	59	78	1,421,000
CALIFORNIA					
Folsom (FIP)	64	76	62	64	1,000,000
Hetch Hetchy (MP)	68	52	27	72	360,400
Isabella (FIR)	82	36	28	59	568,100
Pine Flat (FI)	76	75	56	66	1,001,000
Clair Engle Lake (Lewiston) (P)	91	86	83	87	2,438,000
Lake Almanor (P)	93	102	54	88	1,036,000
Lake Berryessa (FIMW)	104	101	88	103	1,600,000
Millerton Lake (FI)	82	97	66	84	503,200
Shasta Lake (FIPR)	85	90	84	80	4,377,000
CALIFORNIA--NEVADA					
Lake Tahoe (IPR)	76	75	55	75	744,600
NEVADA					
Rye Patch (I)	86	50	68	91	194,300
ARIZONA--NEVADA					
Lake Mead and Lake Mohave (FIMP)	94	89	66	93	27,970,000
ARIZONA					
San Carlos (IP)	54	26	22	34	1,073,000
Salt and Verde River system (IMPR)	94	83	50	82	2,073,000
NEW MEXICO					
Conchas (FIR)	76	46	80	75	330,100
Elephant Butte and Caballo (FIPR)	44	33	30	44	2,453,000

[a]1 acre-foot = 0.0436 million cubic feet = 0.326 million gallons = 0.504 cubic feet per second day.
[b]Thousands of kilowatt-hours (the potential electric power that could be generated by the volume of water in storage).

FLOW OF LARGE RIVERS DURING MARCH 1983

Station number	Stream and place of determination	Drainage area (square miles)	Mean annual discharge through September 1980 (cubic feet per second)	March 1983					
				Monthly mean discharge (cubic feet per second)	Percent of median monthly discharge, 1951–80	Change in discharge from previous month (percent)	Discharge near end of month		
							Cubic feet per second	Million gallons per day	Date
01014000	St. John River below Fish River at Fort Kent, Maine	5,690	9,647	3,749	154	+23	11,500	7,430	31
01318500	Hudson River at Hadley, N.Y	1,664	2,909	3,720	124	+44	2,900	1,870	31
01357500	Mohawk River at Cohoes, N.Y	3,456	5,734	9,900	93	+98	5,000	3,200	31
01463500	Delaware River at Trenton, N.J	6,780	11,750	23,015	115	+53	26,400	17,060	30
01570500	Susquehanna River at Harrisburg, Pa	24,100	34,530	78,520	109	+98	52,200	33,740	28
01646500	Potomac River near Washington, D.C.	11,560	[1] 11,490	25,900	106	+64	26,700	17,260	31
02105500	Cape Fear River at William O. Huske Lock near Tarheel, N.C.	4,810	5,005	17,000	169	+21	26,000	16,800	29
02131000	Pee Dee River at Peedee, S.C	8,830	9,851	28,900	160	+18	35,900	23,200	29
02226000	Altamaha River at Doctortown, Ga	13,600	13,880	46,580	148	+14	39,400	25,460	31
02320500	Suwannee River at Branford, Fla	7,880	6,987	21,500	191	+76	25,800	16,670	31
02358000	Apalachicola River at Chattahoochee, Fla	17,200	22,570	58,300	142	+12	77,400	50,020	31
02467000	Tombigbee River at Demopolis lock and dam near Coatopa, Ala	15,400	23,300	81,410	171	-5	34,900	22,560	31
02489500	Pearl River near Bogalusa, La	6,630	9,768	32,584	186	-37	29,900	19,320	31
03049500	Allegheny River at Natrona, Pa	11,410	[1] 19,480	22,130	54	+21	47,500	30,700	25
03085000	Monongahela River at Braddock, Pa.	7,337	[1] 12,510	19,770	93	+31	26,800	17,320	25
03193000	Kanawha River at Kanawha Falls, W. Va	8,367	12,590	24,320	102	+20	17,700	11,440	27
03234500	Scioto River at Higby, Ohio	5,131	4,547	1,507	16	-56	1,860	1,202	31
03294500	Ohio River at Louisville, Ky[2]	91,170	116,000	122,800	50	-10	166,100	107,350	27
03377500	Wabash River at Mount Carmel, Ill	28,635	27,220	23,300	40	-26	34,200	22,100	31
03469000	French Broad River below Douglas Dam, Tenn	4,543	6,798	12,774	109	+2	.....	.....	...
04084500	Fox River at Rapide Croche Dam, near Wrightstown, Wis[2]	6,150	4,163	4,616	109	+9	3,122	2,018	22
04264331	St. Lawrence River at Cornwall, Ontario–near Massena, N.Y[3]	299,000	242,700	268,300	107	+10	270,000	175,000	31
050115	St. Maurice River at Grand Mere, Quebec	16,300	25,150	9,420	113	-35	17,700	11,440	31
05082500	Red River of the North at Grand Forks, N. Dak	30,100	2,551	3,760	202	+151	7,540	4,873	25
05133500	Rainy River at Manitou Rapids, Minn.	19,400	12,830	11,300	117	+5	11,100	7,170	28
05330000	Minnesota River near Jordan, Minn.	16,200	3,402	20,958	660	+471	.....	.....	...
05331000	Mississippi River at St. Paul, Minn	36,800	[1] 10,610	43,223	559	+306	.....	.....	...
05365500	Chippewa River at Chippewa Falls, Wis	5,600	5,100	12,642	270	+135	4,400	2,840	31
05407000	Wisconsin River at Muscoda, Wis	10,300	8,617	20,275	211	+88	12,970	8,382	31
05446500	Rock River near Joslin, Ill	9,551	5,873	11,100	120	+42	10,800	6,980	31
05474500	Mississippi River at Keokuk, Iowa	119,000	62,620	170,400	203	+101	170,700	110,330	31
06214500	Yellowstone River at Billings, Mont	11,796	7,038	2,868	92	-1	2,750	1,777	29
06934500	Missouri River at Hermann, Mo	524,200	79,490	119,120	161	+29	187,800	121,380	30
07289000	Mississippi River at Vicksburg, Miss[4]	1,140,500	576,600	739,900	90	-3	696,000	449,800	28
07331000	Washita River near Dickson, Okla.	7,202	1,368	1,240	209	-14	645	416	24
08276500	Rio Grande below Taos Junction Bridge, near Taos, N. Mex	9,730	725	798	140	+12	750	484	31
09315000	Green River at Green River, Utah.	40,600	6,298	6,901	171	+48	.....	.....	...
11425500	Sacramento River at Verona, Calif	21,257	18,820	74,664	238	+7	69,000	44,600	28
13269000	Snake River at Weiser, Idaho	69,200	18,050	45,000	227	+52	37,990	24,553	29
13317000	Salmon River at White Bird, Idaho	13,550	11,250	8,730	172	+55	6,590	4,259	29
13342500	Clearwater River at Spalding, Idaho	9,570	15,480	19,490	152	+15	12,700	8,210	29
14105700	Columbia River at The Dalles, Oreg[5]	237,000	193,100	238,600	194	+73	309,400	199,970	28
14191000	Willamette River at Salem, Oreg.	7,280	23,510	47,300	146	-28	25,300	16,350	28
15515500	Tanana River at Nenana, Alaska.	25,600	23,460	6,497	106	-3	6,400	4,140	31
8MF005	Fraser River at Hope, British Columbia.	83,800	96,290	43,784	136	+28	44,138	28,527	30

[1] Adjusted.
[2] Records furnished by Corps of Engineers.
[3] Records furnished by Buffalo District, Corps of Engineers, through International St. Lawrence River Board of Control. Discharges shown are considered to be the same as discharge at Ogdensburg, N.Y. when adjusted for storage in Lake St. Lawrence.
[4] Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.
[5] Discharge determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.

DISSOLVED SOLIDS AND WATER TEMPERATURES FOR MARCH AT DOWNSTREAM SITES ON SIX LARGE RIVERS

Station number	Station name	March data of following calendar years	Stream discharge during month	Dissolved-solids concentration during month[a]		Dissolved-solids discharge during month[a]			Water temperature during month[b]		
			Mean (cfs)	Minimum (mg/L)	Maximum (mg/L)	Mean	Minimum	Maximum	Mean in°C	Minimum, in°C	Maximum, in°C
						(tons per day)					
	NORTHEAST										
01463500	Delaware River at Trenton, N.J. (Morrisville, Pa.)	1983	23,000	75	105	5,100	2,800	9,000	6.0	4.5	8.5
		1945–82	20,480	44	136	.....	1,100	98,100	.....	0	15.0
		(Extreme yr)		(1945)	(1980)		(1980)	(1978)			
			[c]20,040								
04264331	St. Lawrence River at Cornwall, Ontario, near Massena, N.Y. median streamflow at Ogdensburg, N.Y.	1983	268,000	165	166	120,000	120,000	121,000	2.0	1.0	3.0
		1976–82	268,200	164	170	120,000	94,000	145,000	1.0	0	2.0
		(Extreme yr)		(1977)	(1979)		(1977)	(1978)			
			[c]250,000								
	SOUTHEAST										
0728900	Mississippi River at Vicksburg, Miss.	1983	*739,900	.....	.....	.....	.....	.....	....	....	....
		1976–82	867,700	166	254	457,000	180,000	803,000	9.0	5.0	14.5
		(Extreme yr)		(1979)	(1980)		(1981)	(1979)			
			[c]814,500								
	WESTERN GREAT LAKES REGION										
03612500	Ohio River at lock and dam 53, near Grand Chain, Ill. (25 miles west of Paducah, Ky.; streamflow station at Metropolis, Ill.)	1983	**278,000	195	204	.....	98,200	195,000	....	6.5	10.5
		1955–82	557,500	128	312	.....	54,000	776,000	....	0.5	14.5
		(Extreme yr)		(1955–64)	(1968)		(1968)	(1979)			
			[c]578,300								
	MIDCONTINENT										
06934500	Missouri River at Hermann, Mo. (60 miles west of St. Louis, Mo.)	1983	119,000	290	431	117,000	95,000	164,000	7.5	6.0	10.0
		1976–82	100,000	186	530	77,400	29,300	199,000	7.5	0	13.0
		(Extreme yr)		(1978)	(1981)		(1977)	(1979)			
			[c]74,200								
	WEST										
14128910	Columbia River at Warrendale, Oreg. (streamflow station at The Dalles, Oreg.)	1983	332,000	101	115	96,600	77,900	114,300	7.0	6.0	8.0
		1976–82	185,700	87	126	52,600	25,600	105,000	6.0	3.0	8.0
		(Extreme yr)		(1980)	(1979)		(1980)	(1982)			
			[c]122,950								

[a]Dissolved-solids concentrations when not analyzed directly, are calculated on basis of measurements of specific conductance.
[b]To convert °C to °F: [(1.8 X°C) + 32] = °F.
[c]Median of monthly values for 30-year reference period, water years 1951–80, for comparison with data for current month.
*Dissolved-solids and water temperature records are not available for March.
**Dissolved-solids records are for first 25 days of month.

NATIONAL WATER CONDITIONS

March 1983

Based on reports from the Canadian and U.S. Field offices; completed April 11, 1983

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EXPLANATION OF DATA

Cover map shows generalized pattern of streamflow for the month based on 18 index stream-gaging stations in Canada and 164 index stations in the United States. Alaska and Hawaii inset maps show streamflow only at the index gaging stations that are located near the points shown by the arrows.

Streamflow for the current month is compared with flow for the same month in the 30-year reference period, 1951–80. Streamflow is considered to be *below the normal range* if it is within the range of the low flows that have occurred 25 percent of the time (below the lower quartile) during the reference period. Flow is considered to be *above the normal range* if it is within the range of the high flows that have occurred 25 percent of the time (above the upper quartile).

Flow higher than the lower quartile but lower than the upper quartile is described as being *within the normal range*. In the National Water Conditions, the median is obtained by ranking the 30 flows for each month of the reference period in their order of magnitude; the highest flow is number 1, the lowest flow is number 30, and the average of the 15th and 16th highest flows is the median. One-half of the time you would expect the flows for the month to be below the median and one-half of the time to be above the median.

Statements about *ground-water levels* refer to conditions near the end of the month. The water level in each key observation well is compared with average level for the end of the month determined from the entire past record for that well or from a 30-year reference period, 1951–80. *Changes in ground-water levels*, unless described otherwise, are from the end of the previous month to the end of the current month.

Dissolved solids and temperature data for March are given for six stream-sampling sites that are part of the National Stream Quality Accounting Network (NASQAN). Dissolved solids are minerals dissolved in water and usually consist predominantly of silica and ions of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulfate, chloride, and nitrate. Dissolved-solids discharge represents the total daily amount of dissolved minerals carried by the stream. Dissolved-solids *concentrations* are generally higher during periods of low streamflow, but the highest dissolved-solids *discharges* occur during periods of high streamflow because the total quantities of water, and therefore total load of dissolved minerals, are so much greater than at time of low flow.

METRIC EQUIVALENTS OF UNITS USED IN THE NATIONAL WATER CONDITIONS

1 foot = 0.3048 meter

1 acre-foot = 1,233 cubic meters

1 million cubic feet = 28,320 cubic meters

1 cubic foot per second =
0.02832 cubic meters per second =
1.699 cubic meters per minute

1 cubic foot per second · day = 2,447 cubic meters

1 mile = 1.609 kilometers

1 square mile = 259 hectares = 2.59 square kilometers

1 million gallons = 3,785 cubic meters =
3.785 million liters

1 million gallons per day = 694.4 gallons per minute =
2.629 cubic meters per minute =
3,785 cubic meters per day

(Round-number conversions, to nearest four significant figures)

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